

**The genus *Acanthochitona* Gray, 1821 (Mollusca, Polyplacophora)
in the north-eastern Atlantic Ocean
and in the Mediterranean Sea,
with designation of neotypes of *A. fascicularis* (L., 1767)
and of *A. crinita* (Pennant, 1777)**

by Pieter KAAS

Abstract. — To settle the question which of the three known European species of the genus *Acanthochitona* Gray, 1821, should be recognized as *Chiton fascicularis* Linnaeus, 1767, designated by GRAY as the type of the genus, neotypes of the Linnean species from "the coast of Barbary" as well as of *Chiton crinitus* Pennant, 1777, from the coast of Aberdeen, are designated. Of *Chiton discrepans* Brown, 1827, a lectotype has been chosen. A close examination of the types of DE ROCHEBRUNE's nominal species of *Acanthochitona* from NW Africa, leads to the conclusion that some of them are synonymous with either *A. fascicularis* or *crinita*, two others are unrecognizable, and only one, *A. joallesi*, proves to be a valid species. Also *A. subrubicunda* Leloup, 1941, from Sénégal, in a later paper (1968) wrongly identified by LELOUP with *discrepans*, proves to be a valid species. Synonyms of the three European species are given, as well as a dichotomous identification key.

Résumé. — Trois espèces du genre *Acanthochitona* sont présentes dans les mers d'Europe. Afin de stabiliser le nom *Chiton fascicularis* Linnaeus, 1767, désigné par GRAY comme l'espèce-type du genre, l'auteur choisit un néotype originaire de la « côte de Barbarie », la localité-type. Un néotype de *Chiton crinitus* Pennant, 1777, de la côte d'Aberdeen, et un lectotype de *Chiton discrepans* Brown, 1827, sont également choisis. Un examen approfondi des types des différents *Acanthochitona* du nord-ouest de l'Afrique décrits par DE ROCHEBRUNE aboutit aux conclusions suivantes : plusieurs de ces noms sont synonymes d'*A. fascicularis* ou d'*A. crinita* ; deux noms restent des *nomina dubia* non reconnaissables ; seul *A. joallesi*, du Sénégal, est reconnu comme espèce valide. Une autre espèce sénégalaise, *A. subrubicunda* Leloup, 1941, mise à tort par LELOUP (1968) en synonymie avec *A. discrepans*, est également reconnue valide. Une synonymie des trois espèces européennes et une clé de détermination accompagnent le travail.

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INTRODUCTION

« C. testa octovalvi, corpore ad valvulas utrinque fasciculato. *Habitat in Barbaria. E. Brander, Consul svecorum apud Algiros. Corpus cinerum, laeve. Testae leviter carinatae. Fasciculi pilorum totidem, albidii, juxta testarum latera corpori insident.* »

In this way Carolus LINNAEUS (1767 : 1106) described *Chiton fascicularis*, which was designated by J. E. GRAY (1821 : 234) as the type of the new genus *Acanthochitona*.

As there are three species of *Acanthochitona* known from European seas nowadays and the Linnean diagnosis is altogether insufficient to discriminate any of them, it is hard to tell which species LINNAEUS actually had in hands. This is the more difficult as the Linnean collection, in custody of the Linnean Society of London, does not contain any specimen corresponding to the description of *fascicularis* (vide S. HANLEY, 1855 : 15), so that it is impossible to designate a (lecto-, holo-) type specimen. In fact it leaves the genus *Acanthochitona* without an appropriate type species..., an exceptional and inadmissible situation in modern taxonomy. It is the purpose of the present paper to meet with this deficiency.

KEY TO THE EUROPEAN SPECIES OF *Acanthochitona*

After a thorough study of so many specimens of the three European *Acanthochitona* species and of half a dozen nominate species from NW Africa, it was possible to draw up the following dichotomous key, based upon external morphological characteristics.

1. a. Up to 45 mm long ; end valves and latero-pleural areas of intermediate valves covered with small, much crowded, round, flat-topped or slightly concave granules ; jugal area somewhat raised, sharply separated from the latero-pleural areas..... *A. fascicularis*
- b. Up to 30 mm long ; granules on end valves and latero-pleural areas of intermediate valves generally larger, wider apart, oval to drop-shaped ; jugal area hardly raised, not sharply separated from the latero-pleural areas..... 2
2. a. Up to 25 mm long ; length less than two times the width ; back not carinated, side slopes rounded. Girdle covered with two kinds of spicules : small ones up to 50 μ m, dispersed with long ones, up to 320 μ m ; marginal fringe consisting of spicules longer than the dorsal ones...
A. crinita
- b. Up to 30 mm long, length at least two times the breadth, back carinated, side slopes almost straight. Girdle velvety, dorsally densely covered with small, straight, sharply pointed spicules, up to 40 μ m long ; sutural tufts rather short, occasionally one or two extra tufts behind the tail valve ; marginal spicules short..... *A. discrepans*

DISTRIBUTION OF EUROPEAN *Acanthochitona*

A. fascicularis is chiefly found from the English Channel south- and westward to the Azores and Canary Islands and in the whole Mediterranean Sea, with occasional more northern findings : near the Firth of Forth (a single specimen in the RSMNH collection), in W Ireland (common in Kilkieran Bay, Galway Co., David McGRATH leg.), and on the SW coast of Wales (Pembroke, Tenby, G. LYONS coll.).

A. crinita has a more northern distribution : from the Lofoten Is, Norway, S to the Cap Verde Archipelago and in the Mediterranean Sea (hardly or not on the N African coast).

A. discrepans is known from NE Ireland (Strangford Lough, Doctors Bay, RSMNH), from SW Wales (Pembroke, Tenby, G. LYONS coll. ; Milford Haven, McANDREW coll, *teste* J. G. JEFFREYS) and from the S coast of England (Dorset, Weymouth, J. G. JEFFREYS). There are a lot of other localities known from literature, but these all need confirmation.

HISTORICAL REVIEW

As it appears from the introduction LINNAEUS (1767) was the first to describe a fasciculate chiton, calling it *C. fascicularis*. Of the post-Linnean authors PENNANT (1777 : 71, pl. 36, figs 1, A1) was next to describe and figure another species referable to *Acanthochitona*, *Chiton crinitus*. The short diagnosis reads : "Ch. With seven valves ; thick set with short hairs, five-eighth of an inch long. Inhabits the sea near Aberdeen." His figure A1 shows an *Acanthochitona* almost three times enlarged, with seven valves indeed, all the valves with a narrow jugal tract, which means that the head valve was (accidently?) missing. The girdle is decidedly spiculose, with the usual 18 large, exposed, sutural tufts and a striking marginal fringe, by which it is quite different from *fascicularis*.

PENNANT's non-committal diagnosis and bad figures may have been the main cause why *C. crinitus* remained unrecognized, until G. B. SOWERBY II (1840 : figs 87a-93 ; 1840a : 7) clearly showed that *C. fascicularis* (*A. crinita* in our conception) and *C. crinitus* (our *fascicularis*) are decidedly different, easily recognizable from his clear descriptions and excellent figures. All writers on the subject up till then only copied PENNANT's original diagnosis and figures, assigning the European *Acanthochitona*, from Norway to N. Africa, to only one species, *C. fascicularis*, although J. H. CHEMNITZ (1788 : 371, pl. 173 fig. 1688) wrote of that species ("Der haarichte *Chiton*") : "Ganz kleine Exemplare dieser Gattung (= species sensu Chemnitz) findet man bey Norwegen, aber grössere und ansehnlichere im Mittelländischen Meere, insonderheit bey Algier und an den Küsten der Barbaren."

In the mean time, A. Risso (1826 : 268) had erected the genus *Acanthochites* (ex Leach MS) recognizing three new species of it from the environment of Nice, Alpes-Maritimes : *A. communis*, *A. carinatus* and *A. aeneus*. Of these only *A. communis* may be referable to our *fascicularis*. The original diagnosis reads : "A. Dorso, carinato, medio glaberrimo, transversim striolato ; lateribus squamosis, squamis rotundatis, fasciculis viridibus." (*l. c.* : 269, no. 714). Only on account of the phrase "squamis rotundatis" and the given size of the animal ("Long 0.020") the assignment to our *fascicularis* is defensible. Of the two other species the diagnoses are altogether insufficient and as Risso's types appear to be lost (ARNAUD, 1977 : 107, 111, 112) it seems best to regard *A. carinatus* and *A. aeneus* as *nomina dubia*.

A year later Capt. T. BROWN (1827 : pl. 35 fig. 20) introduced, apart from *C. fascicularis* and *C. crinitus* (PENNANT's description and figure only), a *Chiton discrepans*, without describing it. In the legend to the figure we read : "several specimens of this new shell, as a British species, were sent to me by George Lyons, Esq. of Tenby, Wales, as the *C. fascicularis*, which shell, it would appear, is not known on that coast." SOWERBY II (1840a : 2) considered this a synonym of *C. crinitus* (not of PENNANT, but our *fascicularis*). In the second edition of BROWN's work (1844 : 65), a full description of *discrepans* is given, reading : "Shell much elongated, narrow, acutely carinated ; valves shield-shaped, and acutely pointed beneath ; along the centre of the valves is a lance-shaped elevation, which is striated longitudinally ; valves covered with strong, round, elevated, regularly set papillae, except at the edges, which are plain ; at the junction of each valve is a tuft of strong, stiff

bristles, whole margin beset with rather distant, very minute, gray hairs ; valves generally of an orange-yellow ; margin deep umber-brown."

The author compares it with *Chiton fascicularis* (= our *crinita*) : "This species differs... in being much more carinated, in the valves being a third narrower, in the papillae being round instead of oval, and the whole shell being much narrower in proportion to its length." From the above it is clear that *C. discrepans* is different from either *crinita* or *fascicularis*.

L. REEVE, in his "Monograph of the genus *Chiton*" (1847 : pl. 10 fig. 53), discussing *C. fascicularis*, is worth to be quoted in full :

"Naturalists are still somewhat divided in opinion as to whether the fasciculate *Chitons* of the seas of Europe are modifications of one and the same species, or whether they constitute two specifically distinct from each other. That Lamarck should have recorded them under one, after the manner of Linnaeus, is not to be wondered at, considering his very limited knowledge of the genus ; Philippi describes but one, very significantly adding "varietates vel potius species duae occurrent", and details the characters of each precisely as I have observed them. Mr. Sowerby considers them as distinct species ; he assigns the smaller, which is found the more abundantly on our coast, and of which the granules are the larger, to the *C. fascicularis* of Linnaeus, and that under consideration, chiefly inhabiting the Mediterranean and English Channel, to the *C. crinitus* of Pennant.

"After a careful investigation of the subject I am led to conclude, with Mr. Sowerby, that the *C. fascicularis* and *C. crinitus* are distinct species, but I think he has erred in the identification of names. The larger species above described, inhabiting the Mediterranean and English Channel, and in England only the south coast, appears to be the original *C. fascicularis* of Linnaeus, 'from the coast of Barbary', whilst the smaller, which inhabits our coasts throughout and as far north as the Shetland Islands, is the *C. crinitus*, figured on an enlarged scale by Pennant. The *C. fascicularis* of Chemnitz (1788 : 371, pl. 173 fig. 1688) which Mr. Sowerby considers 'beyond doubt' identical with the Linnaean species, answers to neither of those in question..." etc.

REEVE ignored *C. discrepans* Brown, which was synonymized with *C. crinitus* (not of PENNANT) by SOWERBY II (1840a : 2). But he was quite right in the identification of *fascicularis* and *crinitus* : SOWERBY had confounded the two species. Therefore it is to be pitied that REEVE's conclusions were not accepted by his contemporaries. FORBES & HANLEY (1849 : 393) made *C. crinitus* (in REEVE's conception) a synonym of *fascicularis*, while the *fascicularis* according to REEVE was erroneously taken for *discrepans* Brown. Yet, the authors expressed some doubt about their decision as they wrote : "As both this (= *fascicularis*) and *discrepans* inhabit the Mediterranean, it is uncertain, from the brief diagnosis in the 'Systema Naturae', which of them was the Algerine species designated *fascicularis* by the illustrious Linnaeus. In retaining that name for the present species (= our *crinita*), we follow the stream of preceding writers, being unwilling to disturb an accepted name without absolute necessity for so doing."

This argument, however, did not make sense, for, apart from BROWN, SOWERBY and REEVE, all previous authors only knew of one European fasciculate species, which was logically taken for LINNAEUS' *fascicularis*. In fact FORBES & HANLEY unwillingly aggravated the confusion of names.

JEFFREYS (1859 : 106, pl. 3 fig. 9a, b) described a *Chiton gracilis* from Weymouth

(Dorset) and Milford Haven (Wales, Pembroke), which from his description and figures cannot be separated from BROWN's *discrepans*. JEFFREYS himself had arrived at the same conclusion, as he wrote : "*C. gracilis* is more probably the *C. discrepans* of Brown than the species which the late Mr. G. B. Sowerby named '*crinitus*', but as the former name has now been generally adopted for Sowerby's species, it seems a pity, by restoring the latter, to create more confusion, especially as the *crinitus* of Pennant is different from either of them."

This only means that JEFFREYS, against his conscience, contributed to the maintainance of the confusion brought about by FORBES & HANLEY, considering that BROWN's name *discrepans* had been generally adopted for the *fascicularis* of REEVE (and the *crinitus* of SOWERBY II, not PENNANT). How many authors had adopted this error in the course of ten years after its introduction? Only a few, mostly in unimportant local lists and always on the authority of FORBES & HANLEY. It only illustrates how rashly authors handled nomenclatorial problems at that time.

Only a few years later JEFFREYS (1865 : 212) made his *gracilis* a variety of '*fascicularis*' (our *crinita*), writing : "I cannot maintain the distinction which at first seemed to exist between the typical form and the variety *gracilis*, and which induced me to describe the latter as a separate species. Both have every character in common, except the additional tuft, and that is not constant."

There is another remarkable observation on the same page : "The short description by LINNÉ of *C. fascicularis*, and the habitat (Barbary), are rather more applicable to *C. discrepans* (not of BROWN, but our *fascicularis*) than to the present species. Writers on the Mediterranean shells have evidently mistaken one for the other." Nevertheless JEFFREYS did not take the step that REEVE had taken in 1847.

WEINKAUFF (1862 : 33) found *C. fascicularis* at Bône, Algeria. A few years later (1868 : 413) this author declared that it concerned *C. discrepans* auct., adding to it : "Wollte man den Umstand, dass Linné seinem *Chiton fascicularis* nur Algier nach Brander zum Fundort gibt, viel Wichtigkeit beilegen, so müsste die vorliegende Art den Linné'schen Namen erhalten, da nur sie bis jetzt zu Algier beobachtet ist."

Henry A. PILSBRY (1893 : 9) followed without comments the general interpretation of the European malacologists, distinguishing as *A. fascicularis* our *crinita* and as *A. discrepans* our *fascicularis* (1893 : 12). In the same Monograph (1893 : 10) the author unjustly conforms himself with the opinion of di MONTEROSATO (1878 : 47) by accepting the identification of *Chiton aeneus* Risso (1826 : 269) with *C. gracilis* Jeffreys.

In our century ever more taxonomists expressed their doubts about the correctness of the identification of *fascicularis* sensu Forbes & Hanley and most subsequent authors. So J. THIELE (1902 : 288-289) wrote : "... erscheint mir die Benennung der Art mit den länglichen Körnchen, welche ich nur vom Kanal kenne, als *fascicularis* L. einigermaßen zweifelhaft, da Linné Algier als Heimat angegeben hat, übrigens das einzige bestimmte Merkmal das vielleicht zur Erkennung der Art verwendbar ist. Sollte sich herausstellen, dass bei Algier nur die Art mit den runden Körnchen vorkommt, so würde diese wohl richtig als die Linné'sche Art anzusehen sein und der Name *discrepans* unter die Synonymie von *fascicularis* fallen, wenn es feststeht dass Brown dieselbe Art vor sich gehabt hat..."

Then R. WINCKWORTH (1926 : 14-15) seemed to put an end to the confusion, writing : "Unfortunately the species of this genus (= *Acanthochitona* Gray, 1821) have been much

confused, and the result is a muddle which can only be cleared by using unfamiliar names for two of our species, and a familiar name in an unfamiliar sense for the other.

“*A. crinitus* (Pennant), 1777. Type locality, Aberdeen. Although the type specimen is not to be found, this species can be safely identified as *fascicularis* of Forbes & Hanley and most authors from the locality and small figure ; the magnified figure is not good, but that is the result of the distortion of the magnifying glasses of those days. *Chiton fascicularis* Linné is described as from Algiers, and is, therefore, probably *discrepans* auct. non Brown, but as no type specimen exists, the identity of the species is uncertain.

“*A. discrepans* Brown, 1827. Type locality, Tenby. This from locality and figure is certainly the same as *Chiton gracilis* Jeffreys, 1859. Monterosato suggests the latter to be also *A. aeneus* Risso, 1826, but the description given by Risso does not fit our chiton, and Risso's collection was left in such disorder that the fixing of type specimens is hardly possible.

“*A. communis* Risso, 1826. Type locality, Nice. Brief as the description is I think this may certainly be taken as the species usually called *discrepans*.

“Thus we have the following synonymy for the three British species :

“*crinitus* Pennant = *fascicularis* Jeffreys non Linné = *vulgaris* Leach.

“*discrepans* Brown = *gracilis* Jeffreys = *aeneus* Monterosato, ?Risso.

“*communis* Risso = *discrepans* Jeffreys non Brown = ?*fascicularis* L.”.

These are also the names in WINCKWORTH's “List of the marine Mollusca of the British Isles” (1932 : 218) for the three British species of the genus *Acanthochitona*.

In the same year J. Davy DEAN (1926 : 21-22), after having seen a set of chitons from Tenby in the National Museum of Wales, labelled “*Chiton discrepans* Brown”, which are not to be separated from JEFFREYS's *gracilis*, embraced WINCKWORTH's solution.

DODGE (1952 : 21), discussing *Chiton fascicularis* L., 1767, established that “the common *Acanthochiton fascicularis* of most British authors, a native of the Mediterranean and the English Channel, is today accepted as the shell described under that specific name in the ‘Systema’, and the locality given by Linnaeus, ‘in Barbaria’, has been, I suspect, one of the most weighty factors in the identification”.

Recently P. M. ARNAUD (1977 : 112), in his revision of the taxa of Risso, concluded regarding *Acanthochites communis* : “= *Acanthochiton fascicularis* (L., 1767), très probablement, car Risso se réfère formellement à *Chiton fascicularis* in Poli, 1792, vol. 2 : 10, pl. 4 fig. 3” and further : “Le nom *A. communis* doit donc cesser d'être utilisé, au profit d'*A. fascicularis*...”

Finally Anders WARÉN (1980 : 13), after a study of the species described by J. G. JEFFREYS, remarked about *Chiton gracile* (sic!) Jeffreys, 1859 : “This is *Acanthochiton discrepans* (Brown). *Chiton discrepans* Jeffreys, non Brown, is *A. fascicularis* (L.).”

SYSTEMATIC REVIEW

From the preceding paragraph it will be clear that the nomenclature of the three European species of *Acanthochitona* is quite confused. Despite the efforts of WINCKWORTH and others the muddle continues even in our days, as many modern authors are still using the erroneous names introduced about a century and a half ago.

In our opinion the only means to put an end to this unsatisfactory situation is to designate neotype specimens of those species of which the types are either never designated, or definitely lost. That's why we propose the following systematic review.

Class *POLYPLACOPHORA* Gray, 1821

Order NEOLORICATA Bergenhayn, 1955

Suborder ACANTHOCHITONINA Bergenhayn, 1930

Family ACANTHOCHITONIDAE Pilsbry, 1893

Subfamily ACANTHOCHITONINAE Pilsbry, 1893

Genus **ACANTHOCHITONA** Gray, 1821 ¹

Acanthochitona Gray, 1821 : 234 ; type : *Chiton fascicularis* Linnaeus, 1767 (Monotypy) ; VAN BELLE, 1983 : 140-142 (synonymy).

Acanthochitona fascicularis (Linnaeus, 1767)

(Figs 1-6)

NEOTYPE : MNHN (from a lot of eleven specimens, labelled “*Acanthochites fascicularis* L.”).

TYPE LOCALITY : Algeria, Oran. Exp. Sci. de l'Algérie, 1842 (DESHAYES).

Chiton fascicularis Linnaeus, 1767 : 1106 ; POLI, 1792 : 10, pl. 4 fig. 3 ; REEVE, 1847 : pl. 10 sp. & fig. 53.

Non *C. fascicularis* ; SOWERBY, 1840 : figs 87, 87a ; 1840a : 1, et mult. auct.

Acanthochites communis Risso, 1826 : 268.

Chiton fascicularis var. *major* Philippi, 1836 : 108, pl. 7 fig. 2a, b.

Chiton crinitus ; SOWERBY, 1840 : figs 88-93 ; 1840a : 2.

Non *C. crinitus* Pennant, 1777.

1. As the Greek word χιτών (= coat of mail) has the masculine gender, it is hard to understand why GRAY put the generic names *Acanthochitona* and *Lepidochitona* in the accusative. According to WINCKWORTH (1926 : 14) these names must be treated as masculine, but that is no longer in accordance with rule 30b of the I.C.Z.N., reading : “ a generic groups name ending in a Greek or Latin suffix, or in a letter or letters identical which such a suffix, takes the gender appropriate to its ending. ” That's why I have treated *Acanthochitona* as of feminine gender.

- Chiton discrepans*; SOWERBY, 1840a : 2 (in synonymy of *C. crinitus*; SOWERBY, non PENNANT, 1777); FORBES & HANLEY, 1849 : 396, pl. 58 fig. 4; JEFFREYS, 1859 : 106, pl. 3 fig. 10, et mult. auct.
 Non *C. discrepans* Brown, 1827.
Acanthochites carinatus H. Adams & Angas, 1864.
 Non *Acanthochites carinatus* Risso, 1826.
Chiton fascicularis var. *rubra* Issel, 1870 : 4.
Acanthochites discrepans var. *minorflava* di Monterosato, 1878 : 78.
Acanthochites hamatus de Rochebrune, 1882 : 191; THIELE, 1909 : 43.
Anisochiton discrepans vars *elongata*, *marmorata*, *nigrolineata* Dautzenberg, 1893 : 14.
Acanthochites discrepans var. *albina* Dautzenberg & Durouchoux, 1900 : 15.
Anisochiton (Acanthochites) discrepans var. *viridis* Pallary, 1902 : 28.
Acanthochites discrepans var. *violaceolimbata* Dautzenberg & Durouchoux, 1906 : 15.
Acanthochiton(a) communis; WINCKWORTH, 1926 : 15, et mult. auct.
 ?*Acanthochiton heterochaetus* Bergenhayn, 1931 : 20, pl. 1 figs 38-42, pl. 3 figs 67-74.
Acanthochiton discrepans var. *angustivalvus* Bergenhayn, 1931 : 20.
Acanthochiton communis forma *barashi* Leloup, 1969 : 1, figs 1, 2D, 3D, G, 4B.
Acanthochitona bonairensis Kaas, 1972 : 44, text figs 72-73, pl. 3 figs 1, 2; WATTERS, 1981 : 173 (in synonymy of *A. communis*).

The species was excellently described (as *discrepans*) by FORBES & HANLEY (1849) as well as by JEFFREYS (1865). It is the only *Acanthochitona* species regularly reported from the N African coast.

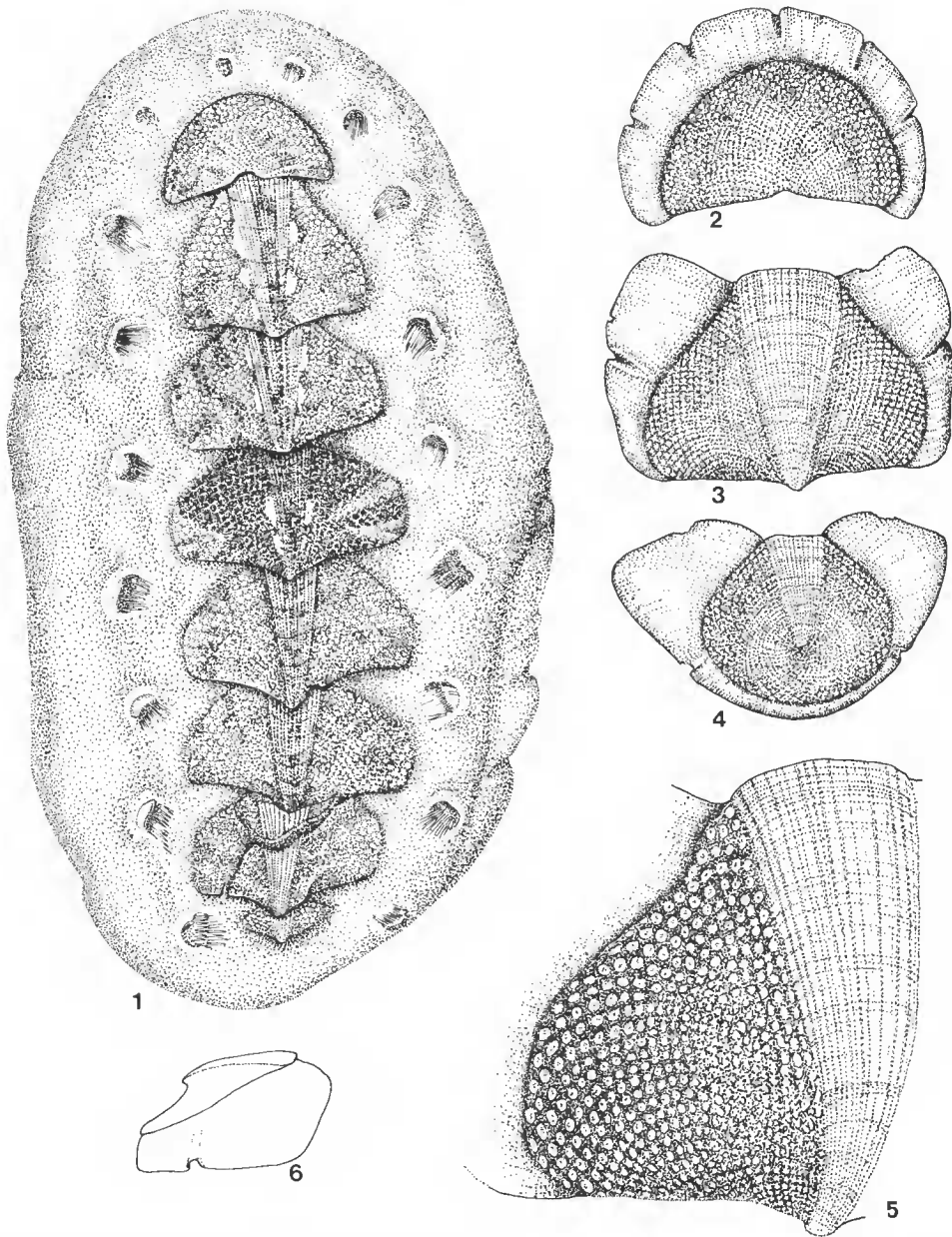
On my request Dr. Philippe BOUCHET, curator of Mollusca at the Muséum national d'Histoire naturelle, Paris, was kind enough to send me all the samples of *Acanthochitona* from that region present in the museum collection for examination, for which I am very grateful. Apart from two samples in alcohol from Morocco (M. Buchet leg., 1903) I received four specimens preserved in alcohol, collected by the Expédition scientifique de l'Algérie, 1842 (DESHAYES) at Bône and eleven specimens in alcohol collected by the same expedition at Oran, both samples being labelled "*Acanthochites fascicularis* L.". Moreover Dr. BOUCHET sent me on loan the unique specimen (holotype) of *Acanthochites hamatus* de Rochebrune, 1882. It is preserved dry and was also collected at Oran by the expedition of DESHAYES, 1842. I can only affirm the establishment of J. THIELE that *hamatus* is a mere synonym of *communis* (= *fascicularis*). The specimen does not differ from other specimens from Oran of that expedition, of which sample it had possibly been taken.

The specimens from Morocco, labelled "*Acanthochites aeneus* Risso", are quite alike those from Bône and Oran.

Also the cruise of the "Professeur Lacaze-Duthiers", 1952, only procured specimens of "*Acanthochitona discrepans*" (non BROWN) near Oran (*vide* MARS, 1957 : 121).

There is only one record of "*Anisochiton (Acanthochiton) fascicularis*" auct. (non LINNAEUS) from the Algerine coast ("Arzew, Mers el Kébir, dépt d'Oran, 14 m, peu fréquent") by P. PALLARY (1900 : 367). On the same page we find for "*Anisochiton (Acanthochiton) discrepans*" auct., non BROWN : "plus fréquent que le précédent (= *fascicularis* auct.), mais toujours peu commun. Oran (Cueva del Agua), Mer el Kébir, Beni Saf (sur un *Mytilus*). Littoral". Despite all efforts I have not succeeded in locating the PALLARY material, which is not in the Paris Museum (Ph. BOUCHET, *in litt.*).

As the present species appears to be not uncommon in the littoral zone on the Algerine coast, it is, in my opinion, no wild guess to assume that this is the one found by BRANDER



FIGS 1-6. — *Acanthochitona fascicularis* (Linnaeus, 1767) : 1, whole specimen, dorsal view, $\times 7$; 2, valve I, $\times 8.4$; 3, valve II, $\times 8.4$; 4, valve VIII, dorsal view, $\times 8.4$; 5, detail of valve II, $\times 17.5$; 6, valve VIII, lateral view, $\times 8.4$.

1, Neotype, in MNHN ; 2-6, specimen from same sample. Oran, Algeria, Exp. scient. de l'Algérie 1842 (DESHAYES).

and described by LINNAEUS. Therefore I have chosen the only specimen preserved rather flat from the Oran sample of eleven as the neotype of *Chiton fascicularis* Linnaeus, 1767. It measures about 20×11 mm and has a wide, fleshy, white girdle, dorsally densely clothed with small, white, glassy, finely striated spicules, 80×20 μ m, dispersed with longer and relatively more slender spicules, 240×12 μ m. The perinotum strongly encroaches at the sutures. The usual 18 tufts, rising from deep pockets in the cuticula, are white, rather short, hardly rising above the surface of the girdle. The valves are slightly beaked, the jugal areas raised, rounded, longitudinally striated, the granules of the tegmentum small, round, flat to slightly concave, much crowded, arranged in curved series in two directions : parallel to the jugum and radiating from it towards the outer margin. Posterior valve almost as long as wide, the mucro subcentral, sharp, postmucronal slope deeply concave directly behind the mucro. Colour of the tegmentum beige, mottled with olivaceous green.

The neotype is stored in the collection of the MNHN, Paris.

After the disastrous tempest of February 1953, when in the West of Holland many ditches were violated by the extreme spring-tide and parts of the country were inundated, a gap in the dike of the isle of Schouwen-Duiveland was closed with the aid of concrete caissons, which had been built at, and were transported over sea from Portland (Dorset, England). After the dikes had been closed and the land was drained again, a fine, live specimen of *A. fascicularis* was collected from one of the caissons, which proves how easily this species is shipped. This may account for (accidental) reports of it from remote parts of the world, such as the Falkland Is and Tierra del Fuego in the Antarctic Ocean, Sydney Harbour, Australia, the isle of Bonaire (Caribbean Sea) and E Asia.

***Acanthochitona crinita* (Pennant, 1777)**

(Figs 7-50)

NEOTYPE : RSMNH 1978.052.02601.

TYPE LOCALITY : Scotland ; Monach Is, North Uist, $57^{\circ}31.5' N$, $07^{\circ}38.5' W$, littoral, 09.05.1978, S. M. SMITH leg.

Chiton crinitus Pennant, 1777 : 71, pl. 36 figs 1, A1 ; REEVE, 1847 : pl. 26 sp. & fig. 176 ; DODGE, 1952 : 21.

Non *Chiton crinitus* ; SOWERBY II, 1840 : figs 88-93 ; 1840a : 2.

Chiton onyx Spengler, 1797 : 95 ; KAAS, 1981 : 220, fig. 6.

Non : *Chiton onyx* ; MÖRCH, 1870 : 113.

Chiton fascicularis ; BROWN, 1827 : pl. 35 fig. 8 (not fig. 5) ; 1844 : 65, pl. 21 fig. 8 (not fig. 5) ; SOWERBY II, 1840 : figs 87, 87a ; 1840a : 1 ; FORBES & HANLEY, 1849 : 393, pl. 59 fig. 5 ; HANLEY, 1855 : 15 ; JEFFREYS, 1865 : 211 ; 1869 : 197, pl. 55 fig. 3 ; et mult auct.

Non *Chiton fascicularis* Linnaeus, 1767.

Chiton fascicularis var. *minor* Philippi, 1836 : 108.

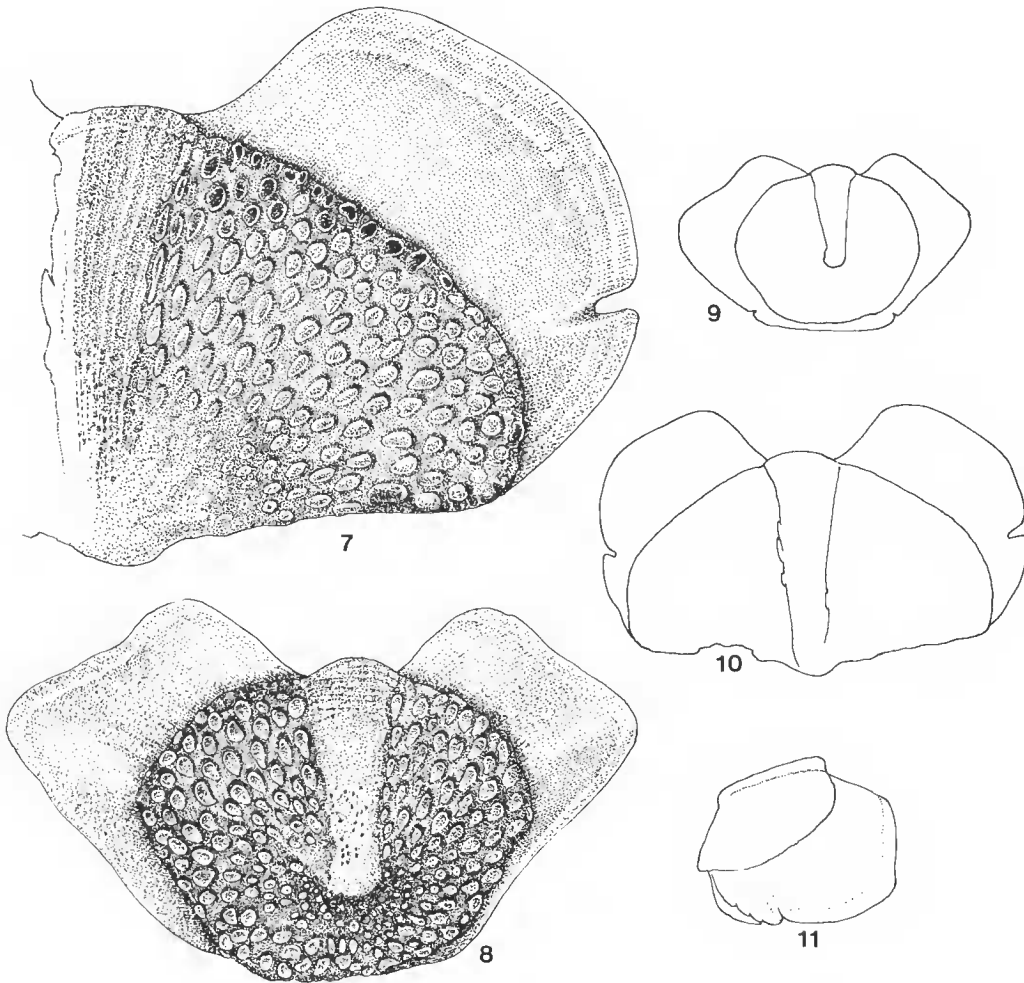
Acanthochaetes vulgaris Leach, 1852 : 229, pl. 10 fig. 8.

Chiton fascicularis var. *attenuata* Jeffreys, 1865 : 212.

Acanthochites (ton) adansonii de Rochebrune, 1881a : 44 ; 1881b : 116 ; 1881c : 238, pl. 17 figs 9a-b ; PILSBRY, 1893 : 13, pl. 8 figs 33-34 ; THIELE, 1909 : 43, pl. 5 figs 69-73 ; BERGENHAYN, 1931 : 28, pl. 3 fig. 81 ; LELOUP, 1968 : 62, figs 3-7, 11, 14.

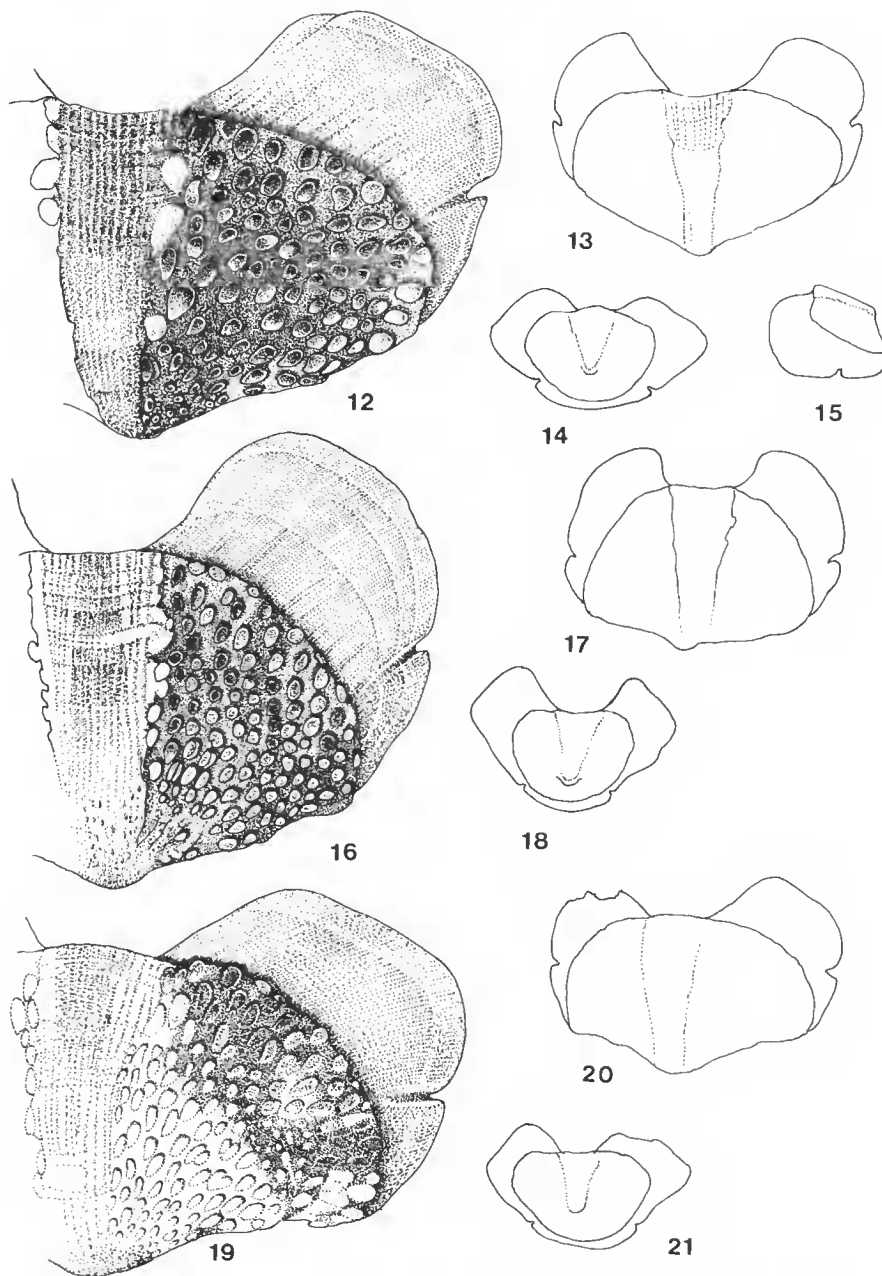
Acanthochites (ton) bouvieri de Rochebrune, 1881a : 45 ; 1881b : 117 ; 1881c : 239, pl. 17 figs 10a,

b ; PILSBRY, 1893 : 13, pl. 3 figs 65-66 ; THIELE, 1909 : 42 ; LELOUP, 1968 : 62, figs 4-7, 14.
Anisochiton (Acanthochites) fascicularis var. *violacea* Pallary, 1902 : 29.
Acanthochites fascicularis vars *lutescens*, *cinnabrina* et *fusca* Dautzenberg & Durouchoux, 1906 : 15.
Acanthochitona crinitus ; WINCKWORTH, 1926 : 15 ; 1932 : 218 ; MCKAY & SMITH, 1979 : 3.
Acanthochiton fascicularis ; LELOUP, 1936 : 3, fig. 3 ; 1968 : 60, figs 1-6, 8-11, 13-14 (bibliography) ;
et mult. auct.
Non *Chiton fascicularis* Linnaeus, 1767.
Acanthochiton oblongus Leloup, 1981 : 1, figs 1A-D, pl. 1.



FIGS 7-11. — *Acanthochitona crinita* (Pennant, 1777) : 7, detail of valve IV, dorsal view, $\times 17.5$; 8, valve VIII, dorsal view, $\times 17.5$; 9, do, camera lucida sketch, $\times 8.4$; 10, valve IV, dorsal view, $\times 8.4$; 11, valve VIII, lateral view, $\times 8.4$.

Specimen from Andernos, Baie d'Arcachon, France, VB 2586b.

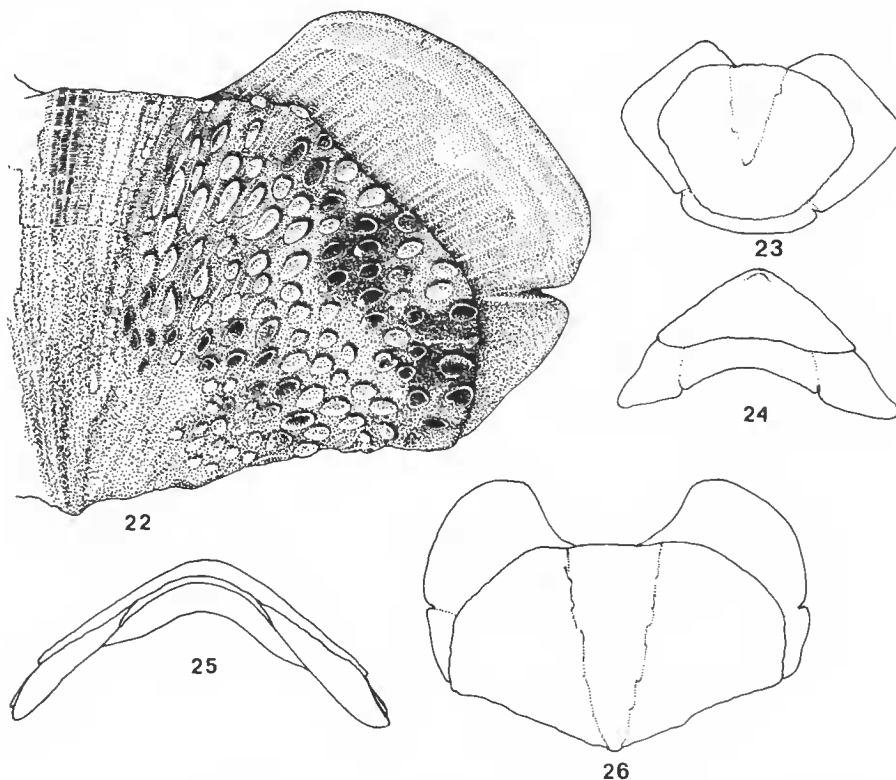


FIGS 12-21. — *Acanthochitona crinita* (Pennant, 1777) : 12, 16, 19, detail of valve IV, dorsal view, $\times 17.5$; 13, 17, 20, camera lucida sketches of valve IV, $\times 8.4$; 14, 18, 21, camera lucida sketches of valve VIII, dorsal view, $\times 8.4$; 15, do, lateral view, $\times 8.4$.

12-15, specimen from Turkey, Sea of Marmora, E coast of Büyükade Id, VIII.1978, I. TüMTÜRK leg., VB 2586d ; 16-18, specimen from Spain, Almadraba, VII.1972, R. HUYCKE leg., VB 2586e ; 19-21, specimen from Portivy, Presqu'île de Quiberon, Brittany, France, VIII.1974, VB 2586c.

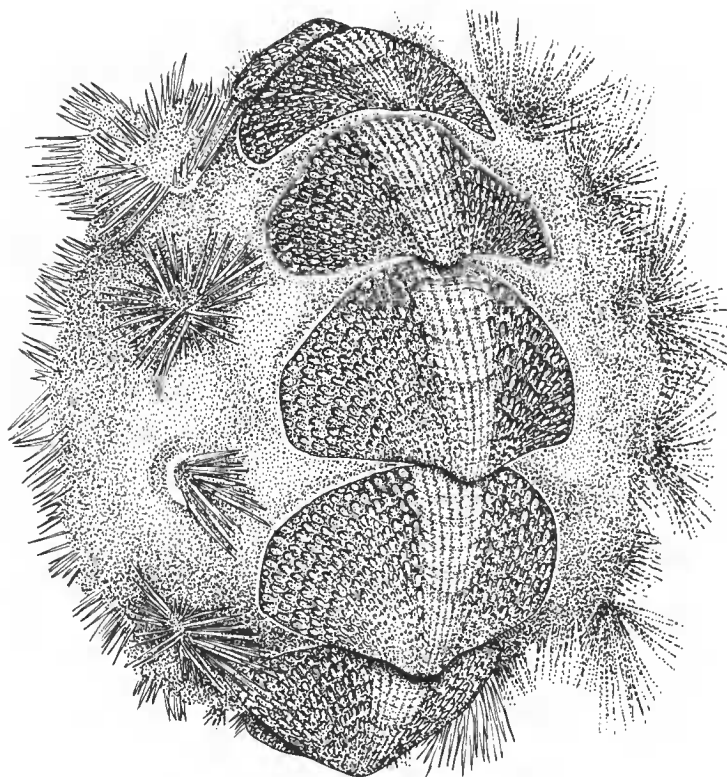
This common species appears to be very variable, as well in its tegmental sculpture as in its dorsal elevation and in the shape of the valves. It is rather common on the Scandinavian coasts from the Lofoten Is to the Kattegat. Specimens from Kongensvoll, at the entrance of Trondheimsfjorden, Norway (figs 28-38), are almost as finely granulated as *A. discrepans*, the granules being round to slightly oval, but others from England, France and the Mediterranean, have large, drop-shaped granules, culminating in the very elongate granulae of *Acanthochiton oblonga* Leloup, 1981, from Malta (figs 39-43), which, however, is only a local variety of *crinita*, as it is in all other respects identical to the typical form. To give an idea of the range of variety I have depicted specimens from widely separated localities (figs 7-27). Also the colour of the tegmentum is very variable.

As a type of *Chiton crinitus*, if ever designated, is not found in the PENNANT collection (*vide* E. A. SMITH, 1913 : 38-41), the designation of a neotype is desirable. That's why I applied to Dr. David HEPPELL, curator of Mollusca at the Royal Scottish Museum, Edinburgh, who generously sent me several samples of *Acanthochitona*, mostly from Scottish localities, on loan. Of these I chose a fine, though rather strongly curled up specimen from the Hebrides, Monach Is, North Uist, as the neotype of *Chiton crinitus* Pennant, 1777



FIGS 22-26. — *Acanthochiton crinita* (Pennant, 1777) : 22, detail of valve IV, dorsal view, $\times 17.5$; 23, camera lucida sketch of valve VIII, dorsal view, $\times 8.4$; 24, do, caudal view, $\times 8.4$; 25, valve IV, rostral view ; 26, do, dorsal view, $\times 8.4$.

Specimen from Trêbeurden, N coast Brittany, low tide, VB leg. et coll. 2586a.

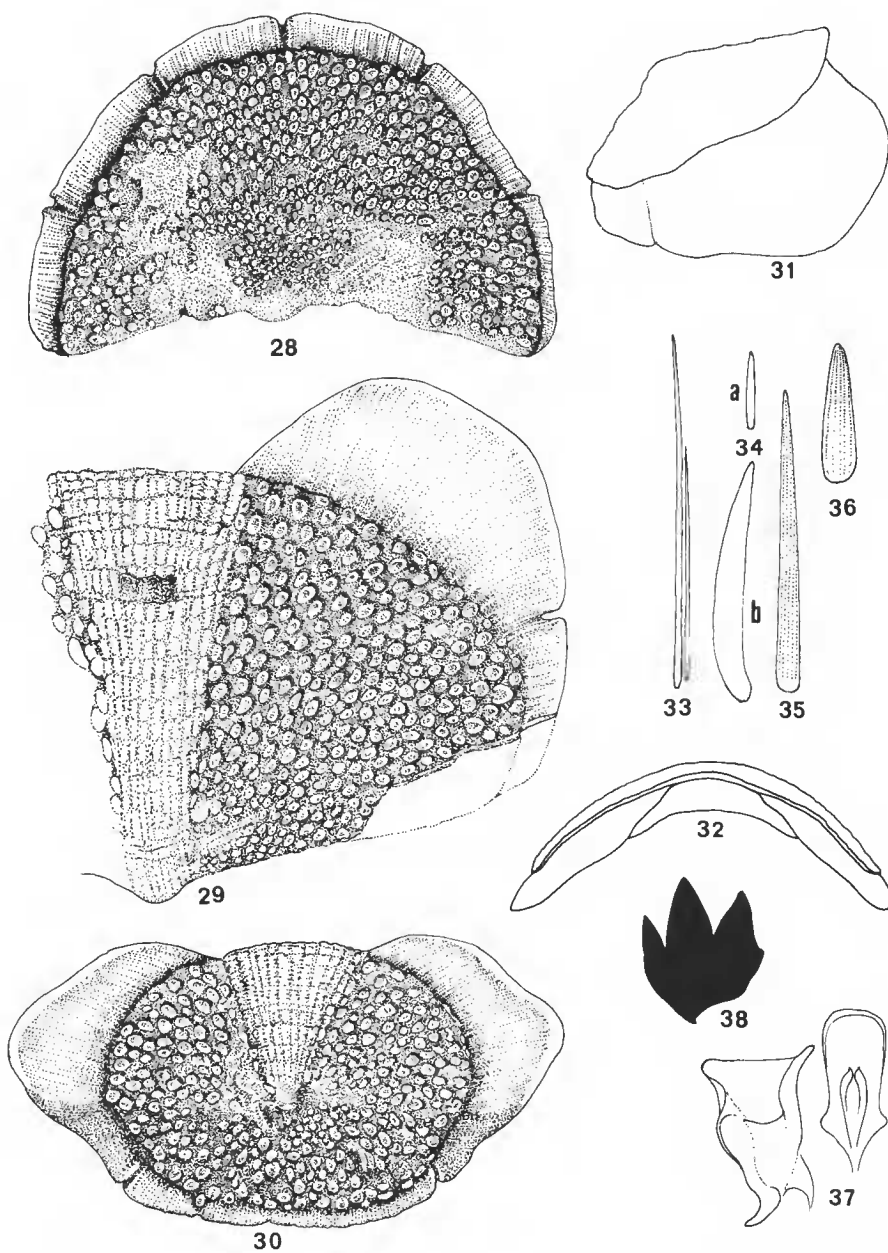


27

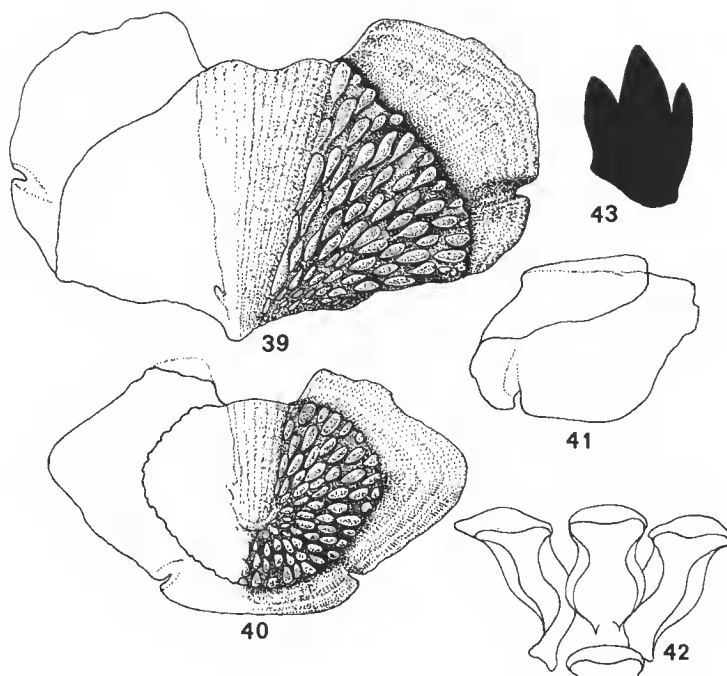
FIG. 27. — *Acanthochitona crinita* (Pennant, 1777) : 27, specimen from Scotland, Hebrides, Monach Is, North Uist, 57°31.5' N-07°38.5' W, 9.V.1978, S. M. SMITH leg, RSMNH 052.02601. Neotype, preserved in alcohol, strongly curled up, dorsal view, $\times 9$.

(fig. 27). The specimen, preserved in alcohol, measures 11×9 mm (estimated length when stretched about 16 mm), the colour of the tegmentum mostly brick red, on the latero-pleural areas here and there marbled with greenish white and sepia, the jugal area of a deeper red (white in the tail valve), decidedly longitudinally grooved. The back is rounded, not carinated, the valves only little elevated, wider than long, the girdle rather strongly encroaching at the sutures. Latero-pleural areas sculptured with moderately widely separated, drop-shaped, flat granules. Girdle rather wide, marbled with white and brown, the usual 18 tufts are white, large, exposed, marginal fringe well developed.

I am much indebted to Dr. Philippe BOUCHET of the Paris Museum, who was so kind as to send me on loan the type material of the five NW African species of *Acanthochitona* described by A. T. DE ROCHEBRUNE, 1881-1884, viz *Acanthochites dakariensis*, *A. adansoni*, *A. bouvieri*, *A. joallesi* and *A. stercorarius*. All these and also *A. garnoti* (de Blainville, 1825) from South Africa, were synonymized with *A. fascicularis* (auct., non LINNAEUS) by E. LELOUP (1968 : 68).



FIGS 28-38. — *Acanthochitona crinita* (Pennant, 1777) : 28, valve I, dorsal view, $\times 17.5$; 29, detail of valve IV, dorsal view, $\times 17.5$; 30, valve VIII, dorsal view, $\times 17.5$; 31, do, camera lucida sketch, lateral view, $\times 17.5$; 32, camera lucida sketch of valve IV, rostral view ; 33, needles of sutural tufts, $\times 28$; 34, dorsal girdle spicules, a small one, b large one, $\times 105$; 35, marginal needle, $\times 105$; 36, ventral girdle spicule, $\times 280$; 37, central and first lateral radula teeth, $\times 196$; 38, head of major lateral tooth, $\times 98$.

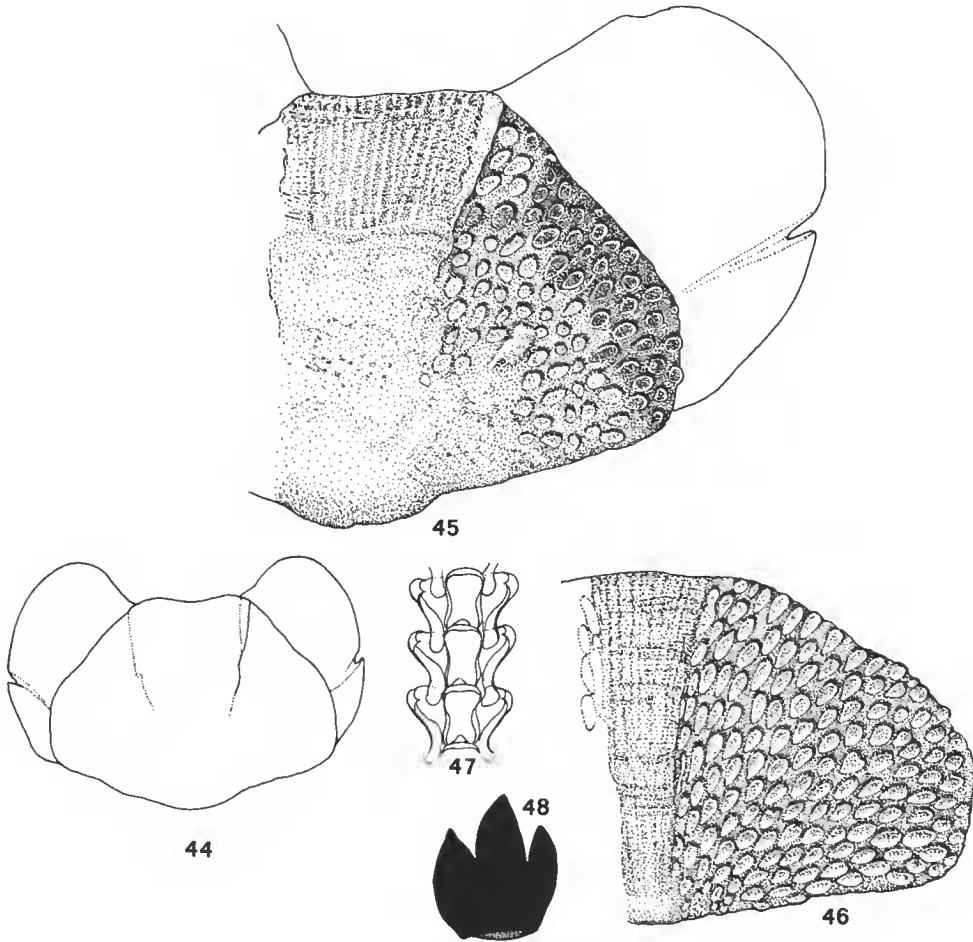


FIGS. 39-43. — *Acanthochitona crinita* (Pennant, 1777) : 39, valve IV, dorsal view, $\times 17.5$; 40, valve VIII, dorsal view, $\times 17.5$; 41, camera lucida sketch of valve VIII, lateral view, $\times 17.5$; 42, central and first lateral radula teeth, $\times 175$; 43, head of major lateral tooth, $\times 175$.

Specimen from the Isle of Malta, Salina Bay, IX.1975, G. SAUNDERS leg., K 4958. Topotype of *Acanthochitona oblonga* Leloup, 1981.

Of *A. adansoni* (figs 44-48) one dry, strongly curled up specimen, 8×6 mm, from Ile de Gorée, Sénégal, DE ROCHEBRUNE leg., here designated as the lectotype, and one specimen in alcohol, valve V missing, and two loose valves, a head valve and an intermediate valve (figs 44, 45) from Cap Vert, Sénégal, BOUVIER leg., paralectotypes, are present. By soaking the lectotype in a weak solution of $\text{Na}_2\text{PO}_4 \cdot 12\text{H}_2\text{O}$ it was possible to isolate the radula, which has been mounted in balsam (figs 47, 48).

THIELE (1909 : 43, pl. 5 figs 69-73), who was the first to study the types of DE ROCHEBRUNE (except *dakariensis*), concluded about *adansoni* : “Diese Art kommt dem *Acanthochites fascicularis* (auct., non Linnaeus) am nächsten, vielleicht geht sie sogar in diese über...” There is no doubt about the conspecificity of *adansoni* and *crinita* ; they differ neither in tegmental sculpture, nor in the covering of the perinotum, so that *Acanthochites adansoni* de Rochebrune, 1881, falls into the synonymy of *Acanthochitona crinita* (Pennant, 1777). In my opinion the same is true of *Acanthochites bouvieri* de Rochebrune, 1881, of which there are two syntypes present in the MNHN collection. Both specimens are preserved dry and strongly curled up. The smaller of the two, measuring 9×6 mm, is here designated as the lectotype, as it is a less eroded shell than the slightly larger (10×7 mm)



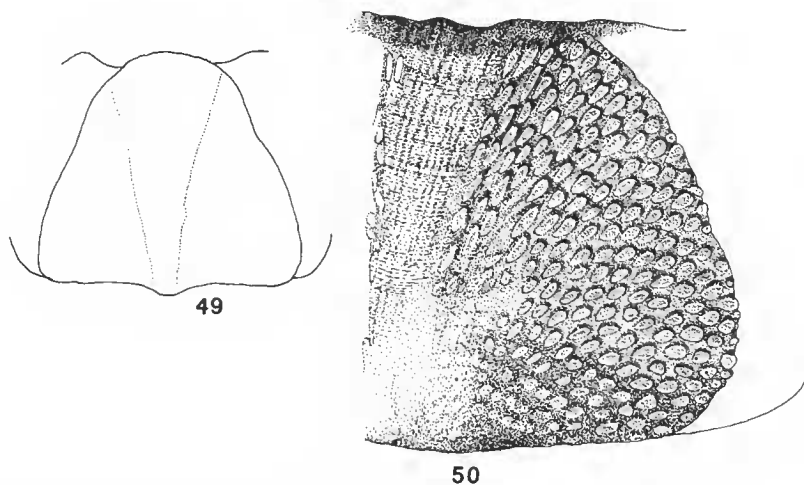
FIGS 44-48. — *Acanthochitona crinita* (Pennant, 1777) : 44, camera lucida sketch of intermediate valve, dorsal view, $\times 8.4$; 45, detail of same valve, $\times 17.5$; 46, detail of valve IV in situ, dorsal view, $\times 17.5$; 47, central and first lateral radula teeth, $\times 87.5$; 48, head of major lateral tooth, $\times 175$.

44-45, paralectotype of *Acanthochites adansoni* de Rochebrune, 1881, Cap Vert, Sénégal, BOUVIER leg., 1 specimen in alcohol, valve V missing, and two loose valves : a head valve and an intermediate valve (figured here), MNHN. 46-48 Lectotype of *Acanthochites adansoni* de Rochebrune, 1881, Ile de Gorée, Sénégal, DE ROCHEBRUNE leg., specimen preserved dry, MNHN.

paralectotype. The valves are somewhat narrower with respect to their length, but otherwise they do not differ from typical *crinita*. According to THIELE (1909 : 42, pl. 5 figs 64-68) *bouvieri* should be closely related to *A. joallei* de Rochebrune, 1881, but that species, from the types, appears to be absolutely different, as well in its sculpture as in the shape of the valves (figs 76-83).

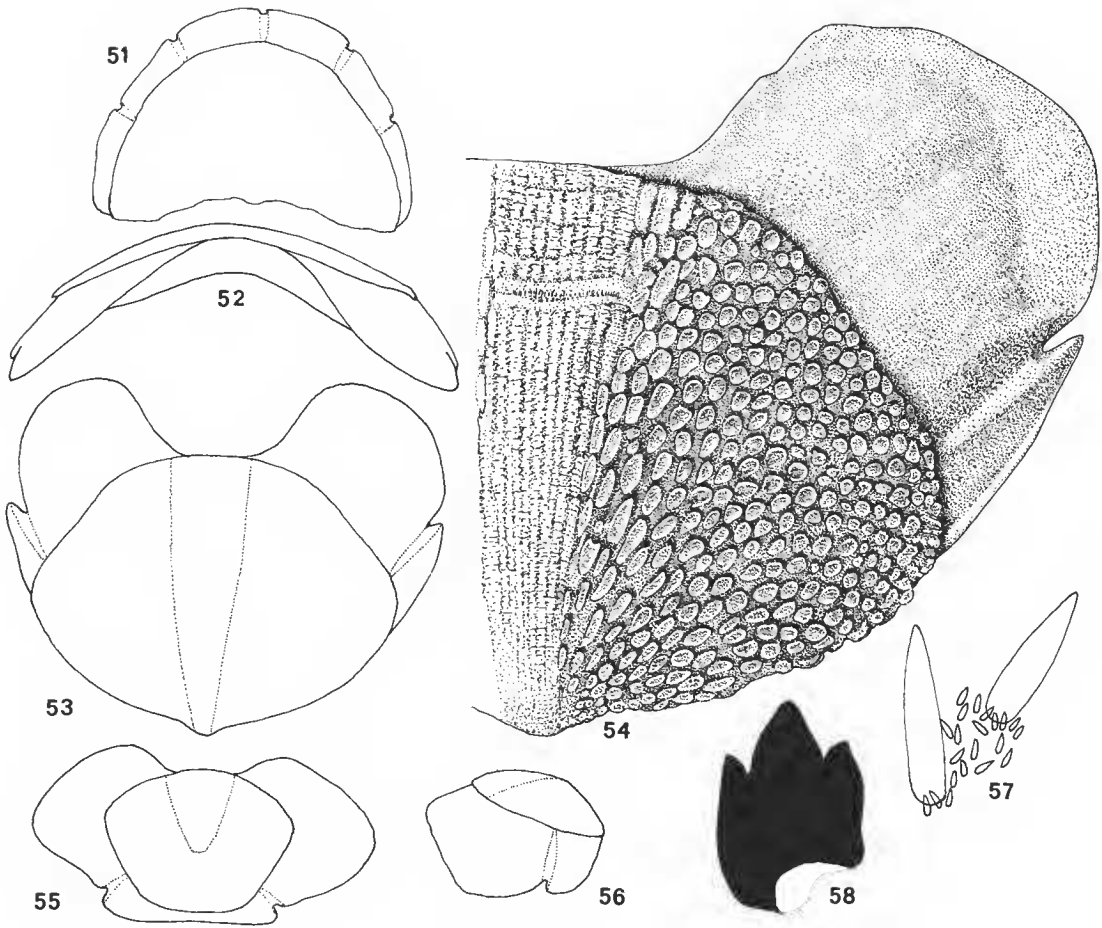
Acanthochiton oblongus Leloup, 1981, from Salina Bay, Isle of Malta, appears to be a local form of *crinita*, with extremely elongate granulae on the latero-pleural areas. A topotype (K 4958), collected by G. SAUNDERS, is illustrated here (figs 39-43). *Acanthochitona garnoti* (de Blainville, 1825) (figs 51-58) was unjustly synonymized with *crinita* by LELOUP. It is a strictly South African species, related to *crinita*, it is true, but different in growing much larger, up to 50 mm, in the articulamentum always characterized by two dark brown spots, and especially in the armature of the girdle, which, in *garnoti*, is thickly covered by extremely small ($32 \times 10 \mu\text{m}$), acutely pointed spicules, dispersed with large, stout, mostly brown, torpedo-like spicules (c. $280 \times 64 \mu\text{m}$).

Chiton onyx Spengler, 1797, considered by subsequent authors as a synonym of *Leptochiton asellus* (Gmelin, 1791), was founded upon a badly preserved specimen (holotype) of *A. crinita*, found "off Norway" (*vide* KAAS, 1981).



FIGS 49-50. — *Acanthochitona crinita* (Pennant, 1777) : 49, camera lucida sketch of valve II in situ, $\times 8.4$; 50, detail of same valve, dorsal view, $\times 17.5$.

Lectotype of *Acanthochites bouvieri* de Rochebrune, 1881, preserved dry, Cap Vert, Sénégal, BOUVIER leg., MNHN.



FIGS 51-58. — *Acanthochitona garnoti* (de Blainville, 1825) : 51, valve I, dorsal view, $\times 8.4$; 52, valve V, rostral view, $\times 8.4$; 53, do, dorsal view, $\times 8.4$; 54, do, detail of tegmental sculpture, $\times 17.5$; 55, valve VIII, dorsal view, $\times 8.4$; 56, do, lateral view, $\times 8.4$; 57, dorsal girdle spicules, $\times 87.5$; 58, head of major lateral radula tooth, $\times 175$.

51-56, specimen from Cape Province, Knysna, in lagoon, 17.IX.1938, H. ENGEL leg., K 3772 ; 57-58, young specimen from Table Bay, Mrs C. M. CONNOLLY leg., K 5071.

Acanthochitona discrepans (Brown, 1827)

(Figs 59-75)

LECTOTYPE : Tenby Museum, Tenby, Pembroke, Wales.

TYPE LOCALITY : Tenby, Pembroke, Wales, coll. G. LYONS.

Chiton discrepans Brown, 1827, pl. 35 fig. 20 ; 1844 : 65, pl. 21 fig. 20.

Non *Chiton discrepans* ; SOWERBY II, 1840a : 2 [in synonymy of *C. crinitus* (non Pennant)] et mult. auct.

Chiton fascicularis ; BROWN, 1827 (ex parte) : pl. 35 fig. 5 ; 1840 : 65 (ex parte), pl. 21 fig. 5.

Non *Chiton fascicularis* Linnaeus.

Chiton gracilis Jeffreys, 1859 : 106, pl. 3 figs 9a-c ; SOWERBY II, 1859 : pl. 10 fig. 6 ; WINCKWORTH, 1926 : 15, pl. 1 fig. 1, 1b-d.

Chiton fascicularis var. *gracilis* Jeffreys, 1865 : 212 ; DEAN, 1926 : 21 ; PILSBRY, 1893 : 11, pl. 4 fig. 83.

?*Acanthochites aeneus* ; DI MONTEROSATO, 1878a : 147 ; 1878b : 78.

Non *Acanthochites aeneus* Risso, 1826.

Acanthochitona discrepans ; WINCKWORTH, 1926 : 15, pl. 1 fig. 2 ; DEAN, 1926 : 21 ; WINCKWORTH, 1932 : 218.

Acanthochiton fascicularis var. *gracilis* ; LELOUP, 1937 : 129, figs 1-3.

Acanthochiton gracilis ; LELOUP, 1968 : 74 (ex parte).

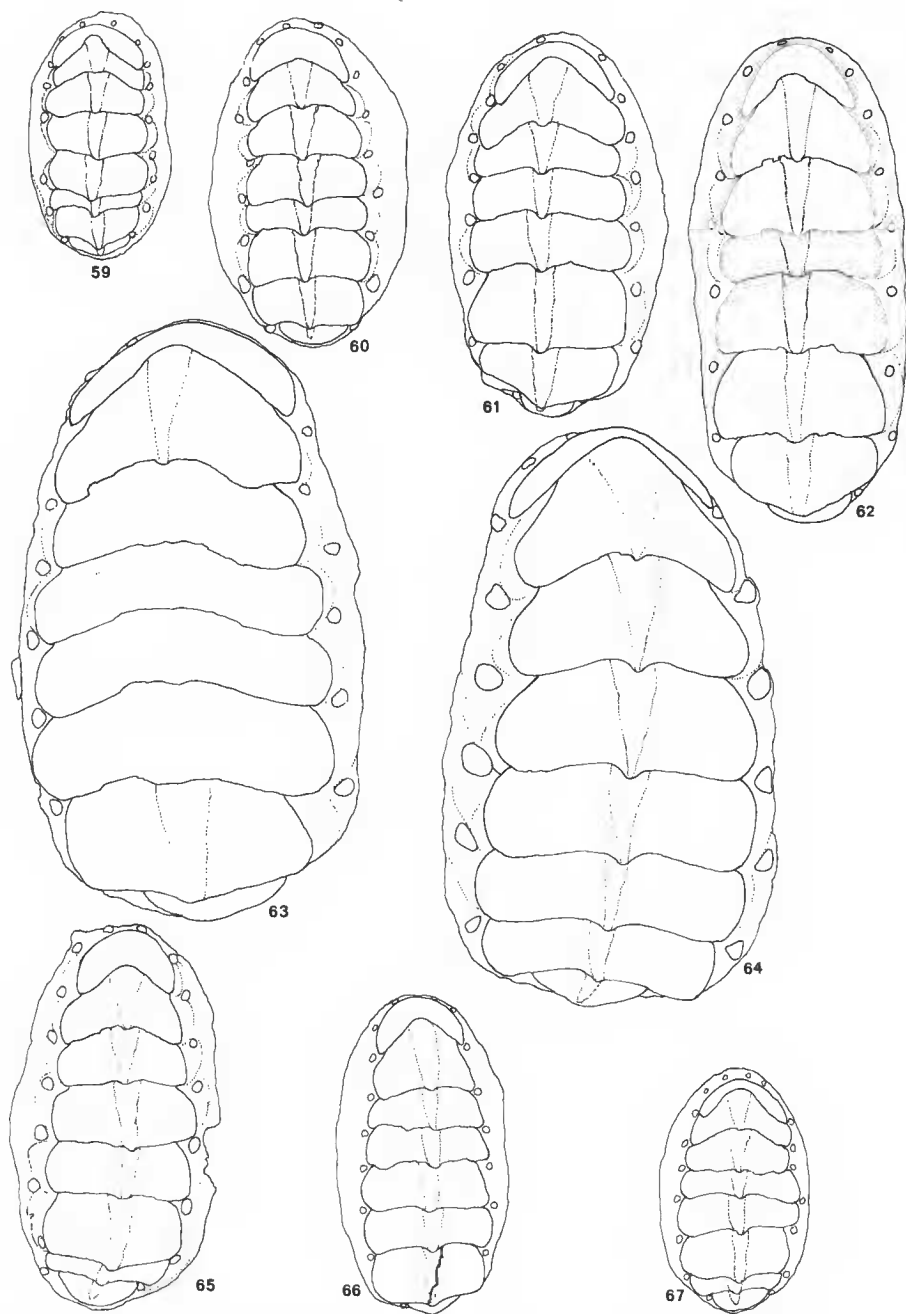
Chiton gracile (sic !) ; WARÉN, 1980 : 13.

It is hard to understand why 19th century authors, such as SOWERBY II, FORBES & HANLEY and JEFFREYS, confounded *Chiton fascicularis* L. with BROWN's *C. discrepans*, as neither the original description (BROWN, 1844 : 65), nor the figure (BROWN, 1827 : pl. 35 fig. 20) are applicable to *fascicularis*.

BROWN got his specimens from George LYONS of Tenby, "where it is common, and where it was mistaken for the *C. fascicularis*".

Figure 20 shows a specimen more than twice as long as wide, with relatively narrow valves. The sutural tufts are hardly discernible against the dark coloured girdle. Figures 5 and 8 are supposed to represent *C. fascicularis* auct., respectively with 20 and 21 tufts on the perinotum. BROWN did not mention the number of tufts in *fascicularis* or *discrepans*, so the deviation may possibly be caused by the imagination of the artist. By its size and shape figure 8 is well in accord with *crinita*, but figure 5, representing a large specimen from Strangford Lough, NE Ireland, County of Down, answers in all respects to *discrepans*, which is known to be fairly commonly found there.

Thanks to the kind cooperation of Mr Graham OLIVER, of the Department of Zoology at the National Museum of Wales, Cardiff, I had the opportunity to study not only two samples of *Acanthochitona discrepans* (Brown) from Tenby (respectively 3 specimens, NMW (Z) 16.174.7 and 5 specimens NMW (Z) 16.174.10, which had formerly been studied by J. D. DEAN, 1926), but also nine specimens, preserved dry, mounted in one row on a tablet, from the LYONS collection in the Tenby Museum, labelled "*Chiton discrepans* Brown" (figs 59-67), representing the original syntypes. Of these the fifth and sixth from the left (figs 63-64) are rather worn but easily recognizable specimens of *A. fascicularis* (L.). The others are unmistakably *discrepans*. Of them I chose the fourth from the left

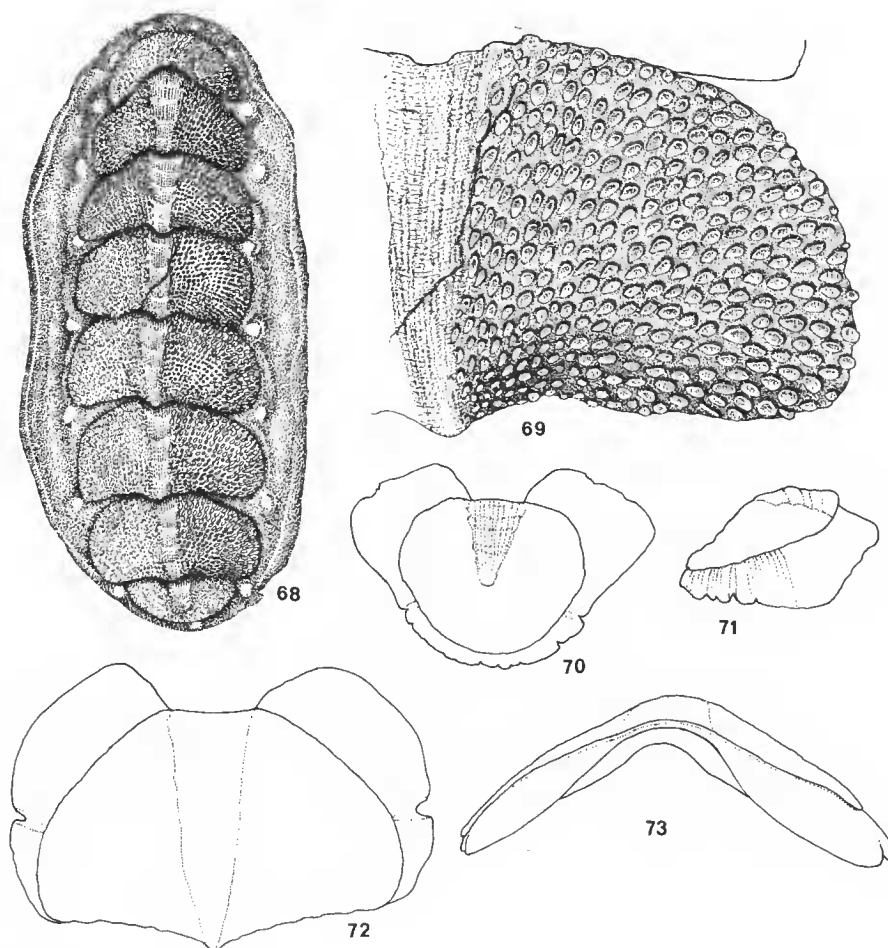


FIGS 59-67. — *Acanthochitona discrepans* (Brown, 1827) : Camera lucida sketches of type-set from Tenby, Pembroke, Wales, George LYONS leg. Tenby Museum. All $\times 3$.

59-61, 65-67, paralectotypes, 62, lectotype. 63, 64, specimens of *Acanthochitona fascicularis* (Linnaeus, 1767).

(fig. 62) as the lectotype, as in shape it mostly resembles BROWN's figure 20, the others becoming para-lectotypes (figs 59-61, 65-67).

The Royal Scottish Museum possesses a sample of several *A. discrepans* from Doctors Bay, Strangford Lough, County of Down, Ireland, the largest measuring 30×14 mm, one out of four with an extra tuft behind the tail valve, of which I made camera lucida sketches of the valves (figs 70-73). JEFFREYS reported his *C. fascicularis* var. *gracilis* (1865 : 212) also from Lough Strangford.



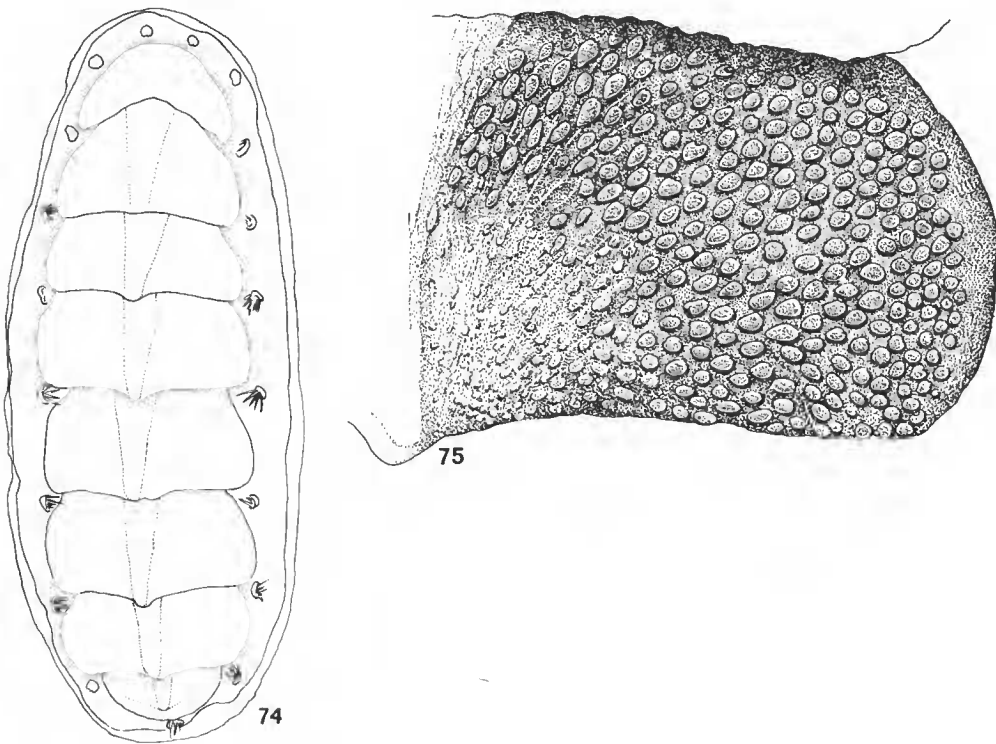
FIGS 68-73. — *Acanthochitona discrepans* (Brown, 1827) : 68, whole specimen, dorsal view, $\times 3.6$; 69, detail of valve IV in situ, $\times 15$; 70-71, camera lucida sketches of valve VIII, dorsal and lateral view, $\times 7.2$; 72-73, camera lucida sketches of valve IV, dorsal and rostral view, $\times 7.2$.

68-69, specimen from Tenby, Pembroke, Wales, largest of a sample of five, NMW (Z) 16.174.10. 70-73, specimen from Doctors Bay, Strangford Lough, Ireland, 03.07.1976, RSMNH 1976.58.02602.

On my request Dr. Joseph ROSEWATER, curator of Mollusca at the United States National Museum (Smithsonian Institution), Washington D.C., was so kind as to send me on loan the syntypes of *Chiton gracilis* Jeffreys, 1859 : 1 specimen from Milford Haven, Pembroke, Wales, coll. McANDREW, USNM 177365 and 12 specimens from Weymouth, Dorset, England, USNM 177364. I chose a fine specimen from Weymouth, 23×9.3 mm, the girdle slightly curled up, with one extra tuft, as the lectotype (figs 74-75). They are in all respects identical to the types and other specimens of *C. discrepans* Brown from Tenby.

The 1-3 extra tufts around the tail valve, which are thought to be a discriminating characteristic of *discrepans*, are in only few specimens present (mostly only one). On the other hand I possess a fine and in all respects normal specimen of *crinita* from Pointe de Barfleur, Manche, Normandy, with one extra tuft (K 4935).

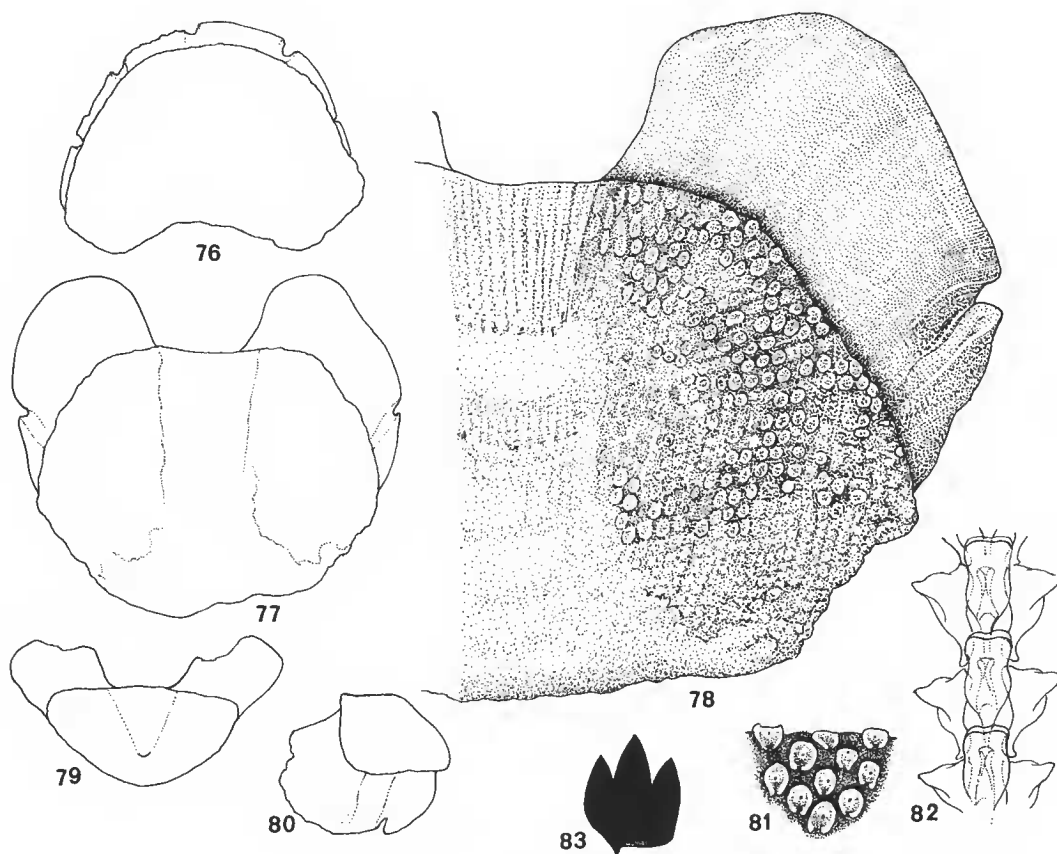
LELOUP (1968 : 74) identified *Acanthochiton heterochaetus* Bergenhayn, 1931, from the Canary Islands, and *A. subrubicundus* Leloup, 1941, from Cap Vert, Sénégal, with *A. gracilis* (Jeffreys, 1859) (= *A. discrepans*), which they are definitely not. In my opinion *A. heterochaetus* may be a small deep water form of *fascicularis*. *A. subrubicundus*, of



FIGS 74-75. — *Acanthochitona discrepans* (Brown, 1827) : 74, camera lucida sketch of whole specimen, dorsal view, $\times 4.2$; 75, right half of valve IV in situ, $\times 17.5$.

Lectotype of *Chiton gracilis* Jeffreys, 1859. Weymouth, Dorset, England, USNM 177364.

which I have seen the type lot, is a valid species, different from all other NW Atlantic species of *Acanthochitona*. Also reports of *A. discrepans* from the Mediterranean Sea need confirmation.



FIGS 76-83. — *Acanthochitona joallesii* (de Rochebrune, 1881) : 76, camera lucida sketch of valve I, dorsal view, $\times 8.4$; 77, do of valve IV, dorsal view, $\times 8.4$; 78, detail of valve IV, dorsal view, $\times 17.5$; 79, camera lucida sketch of valve VIII, dorsal view, $\times 8.4$; 80, do, lateral view, $\times 8.4$; 81, detail of sculpture at anterior margin of pleural area, $\times 35$; 82, central and first lateral radula teeth, $\times 87.5$; 83, head of major lateral tooth, $\times 87.5$.

Specimen from Sénégal, paralectotype, MNHN.

SPECIES INCERTAE SEDIS

Chiton globulosus (Chiereghini MS) Nardo, 1847

TYPE : ?

TYPE LOCALITY : Gulf of Venice.

Chiton globulosus (Chiereghini MS) Nardo, 1847 : 2 ; BRUSINA, 1870 : 43.

The diagnosis of NARDO is too short and too incomplete to decide whether he is right in placing it into the synonymy of *Chiton fascicularis* L. Also BRUSINA (1870 : 43-44) does not contribute much to determine which species of *Acanthochitona* Chiereghini had in hands, so it seems best to regard *C. globulosus* as a *nomen dubium*.

Chiton danielli Sowerby II, 1833

TYPE : ?

TYPE LOCALITY : Cape of Good Hope.

Chiton danielli Sowerby II, 1833 : fig. 48 ; PILSBRY, 1893 : 15 (in synonymy of *garnoti*) ; LELOUP, 1941 : 9 (in synonymy of *Acanthochiton fascicularis* var. *gracilis*).

SOWERBY did not describe his new species, which is said to come from the Cape of Good Hope. PILSBRY thinks it probable that it is conspecific with *garnoti*, mainly on account of its habitat. LELOUP synonymised it with *discrepans* Brown, chiefly on account of the two extra terminal tufts. It appears to be impossible to decide which of the two is the better guess, so it seems wisest to regard *C. danielli* as a *nomen dubium*.

Acanthochites dakariensis de Rochebrune, 1881

(Figs 84-87)

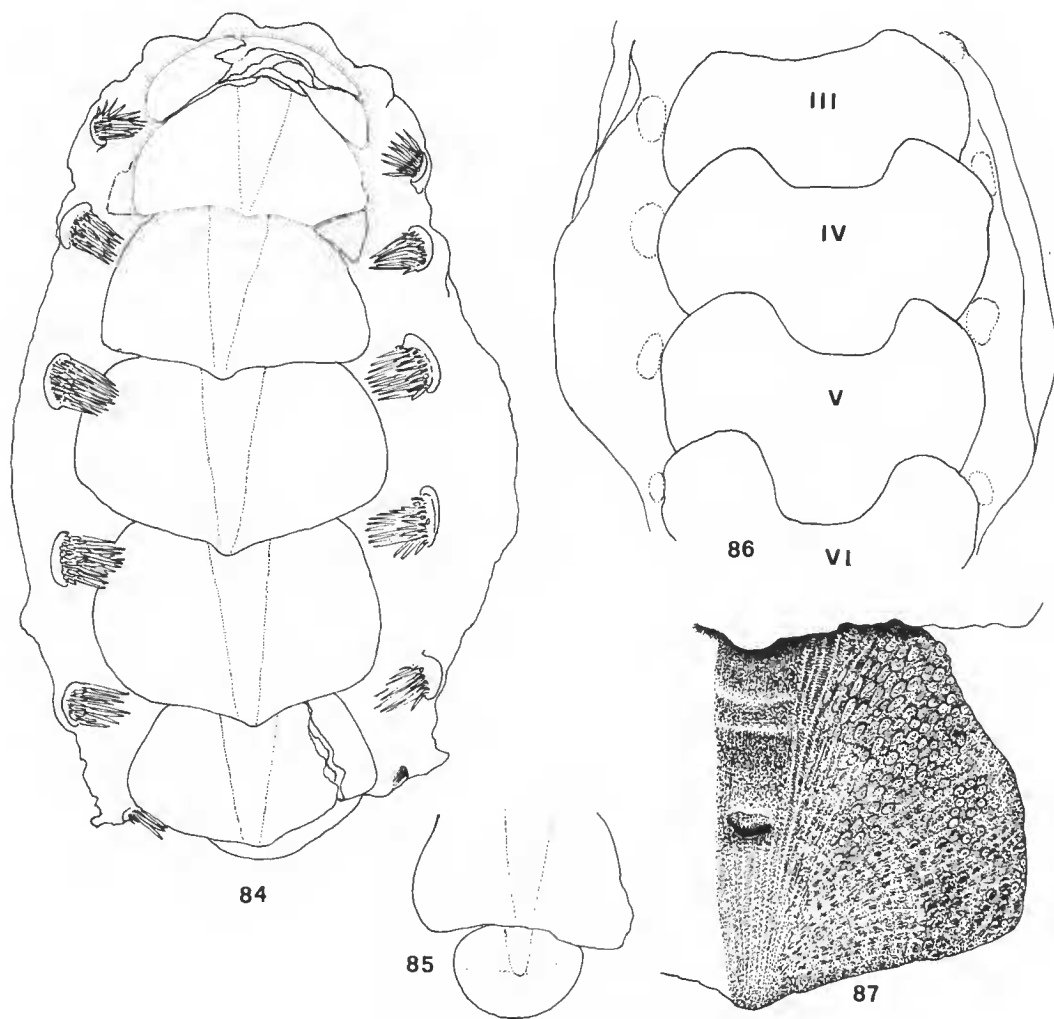
HOLOTYPE : MNHN.

TYPE LOCALITY : Rade de Dakar, Sénégal.

Acanthochites dakariensis de Rochebrune, 1881a : 44 ; 1881b : 116 ; LELOUP, 1968 : 67 (in synonymy of *A. garnoti*).

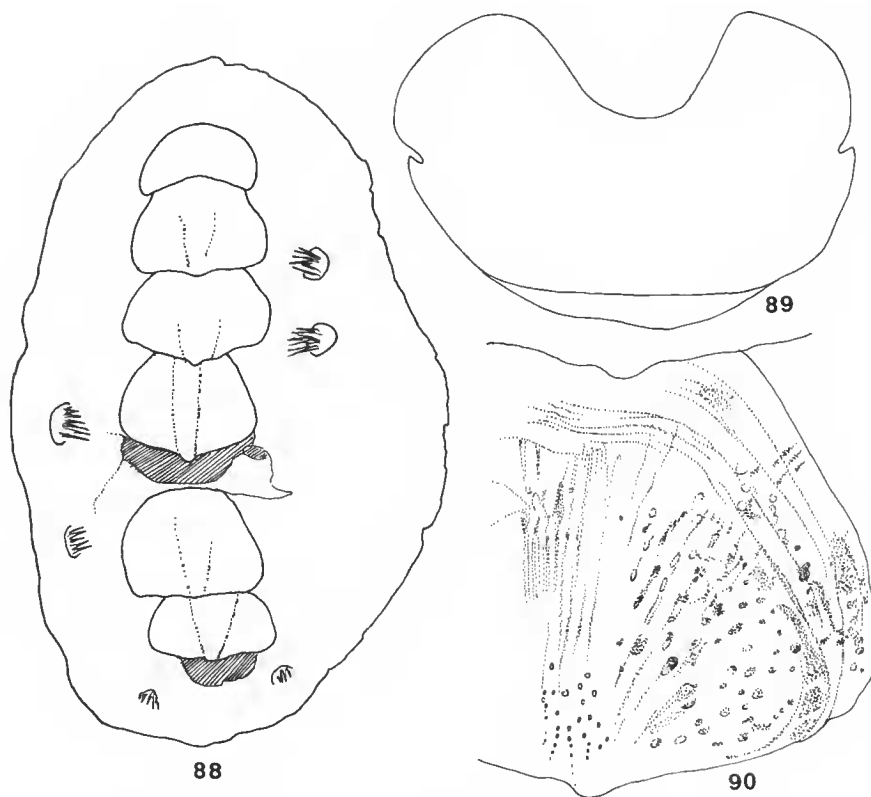
The only specimen in the MNHN collection is a dried and cleaned old mummy, slightly curled, 26 × 16 mm, of which the tegmentum is somewhat eroded and the girdle covering for the greater part worn away. Still, what is left of the sculpture clearly shows that it cannot be conspecific with *A. garnoti*, as the granules on the latero-pleural areas are much smaller and more crowded than in the South African species, which has never been found in the Atlantic Ocean N of the Cape. It has more affinity to *A. joallesii* de Rochebrune,

though it may also be a badly preserved specimen of *A. fascicularis* (L.). A thorough investigation of fresh specimens from the Senegalese coast will be necessary to decide what should be understood about this and also the next species.



FIGS 84-87. — *Acanthochites dakariensis* de Rochebrune, 1881 : 84, camera lucida sketch of whole specimen, dorsal view, $\times 4.2$; 85, do, terminal valves, $\times 4.2$; 86, do, ventral view of valves III-VI in situ, $\times 4.2$; 87, detail of valve IV in situ, dorsal view, $\times 8.4$.

Holotype, preserved dry, "Rochers de Dakar", Sénégal, MNHN.



FIGS 88-90. — *Acanthochites stercorarius* de Rochebrune, 1881 : 88, camera lucida sketch of whole specimen, valves V and VIII missing, dorsal view, $\times 4.2$; 89, ventral view of valve IV, $\times 8.4$; 90, detail of same valve, dorsal view, $\times 17.5$.

Holotype, preserved dry, the missing valves probably in coll. DAUTZENBERG, IRSN, Brussels. Cape Roxo, Guinea, MNHN.

***Acanthochites stercorarius* de Rochebrune, 1884**

(Figs 88-90)

HOLOTYPE : MNHN.

TYPE LOCALITY : Cap Roxo, Guinea.

Acanthochites stercorarius de Rochebrune, 1884 : 32 ; THIELE, 1909 : 44, pl. 6 figs 2-4.

Acanthochiton stercorarius ; LELOUP, 1968 : 65 (in synonymy of *A. fascicularis* auct. forma *adansonii*).

THIELE, who was the first to examine the type in the MNHN collection, thought it might be like *Acanthochitona garnoti* (de Blainville). It is also an old and cleaned, dry mummy of 21.5×13 mm, of which THIELE disarticulated valves V and VIII. LELOUP

could dispose of these valves, which are now in the IRSN, Brussels, probably forming part of the DAUTZENBERG collection.

What is left of the animal is in a very poor condition, the tegmental sculpture altogether worn away, the girdle-covering also badly preserved. As no better material is present, I think it better to declare *A. stercorarius* a *nomen dubium*.

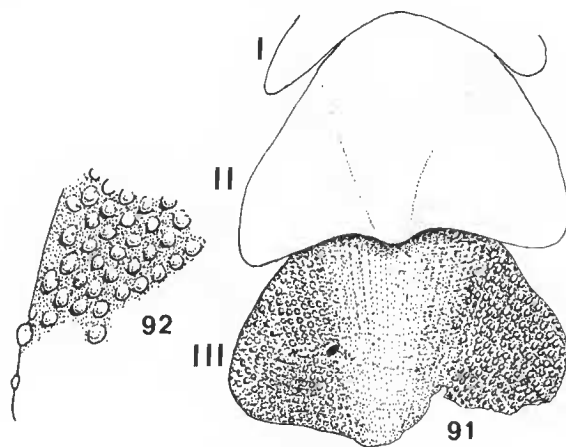
Chiton echinotus de Blainville, 1825

TYPE : ?

TYPE LOCALITY : Côtes de la Manche.

Chiton echinotus de Blainville, 1825 : 552 ; PILSBRY, 1893 : 30.

The description is worthless and so is the figure referred to in CHEMNITZ (1788 : pl. 173 fig. 1688), which some authors believe to be *C. fascicularis* L., others *garnoti* de Blainville. PILSBRY thinks it may be *fascicularis* (= *discrepans* auct.), probably on the ground that DE BLAINVILLE explicitly states that it differs from *crinitus*. However this may be, *C. echinotus* remains unrecognizable and thus a *nomen dubium*.



Figs 91-92. — *Acanthochitona subrubicunda* Leloup, 1941 : 91, Valves II and III in situ, $\times 20$; 92, tegmental sculpture, $\times 40$.

Syntype from "Sylvana" Exp., sta. 143, W. Africa (Sénégal ?). IRSN I.G.9247.

ABBREVIATIONS

- BMNH : British Museum (Natural History), London.
- IRSN : Institut royal des Sciences Naturelles de Belgique, Brussels.
- K : Private collection of the author, now in the RMNH.
- MNHN : Muséum national d'Histoire naturelle, Paris.
- NMW : National Museum of Wales, Cardiff.

RMNH : Rijksmuseum van Natuur-Lijke Historie, Leiden.
RSMNH : Royal Scottish Museum (Natural History), Edinburgh.
USNM : United States National Museum (Smithsonian Institution), Washington DC.
VB : Private collection of R. A. Van Belle, Sint-Niklaas, Belgium.

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